FMC An Agricultural Sciences Company

INSECT ID FIELD TOOL

From Identification to Action

The right insect control, right when you need it.

From identification to action.

When it comes to protecting your crops from pests, early identification and a quick response are critical. Insects can cause significant damage to yield and quality, so knowing what to look for, understanding economic thresholds and proactive planning can make all the difference.

This handy field guide provides a straightforward approach to insect management: spot the pest, assess the damage, and apply the right solution at the right time. With detailed descriptions, scouting tips and economic thresholds, you'll be able to determine when intervention is necessary. And when it's time to act, proven insecticides from FMC deliver effective, science-driven control to safeguard your fields.

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Scouting for Insect Pests: Essential Tips

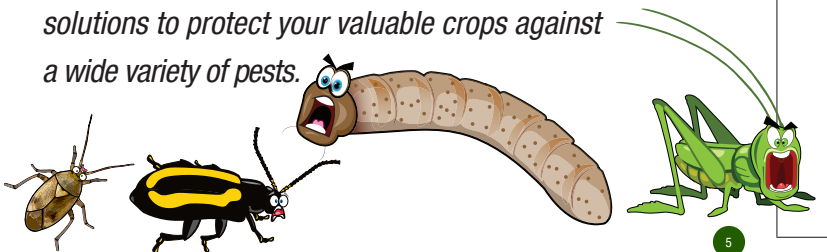
Effective insect management starts with field scouting at regular intervals. Scouting methods vary depending on crop stage and pest type, but keep these key practices in mind before heading into the field:

- **When to Scout:** Check fields **weekly** throughout the growing season. Increase frequency during key pest periods, such as early seedling growth and flowering.
- **Time of Day:** Some pests are more active early in the morning or late in the evening. Adjust scouting times to match pest behavior.
- **Where to Look:** Walk a W or X pattern through the field, stopping at multiple locations to inspect plants, crop residue and soil for feeding damage, eggs or larvae.
- **What to Bring:** This Insect ID Field Tool, hand lens, trowel, sweep net, notepad, phone or tablet and collection vials can help you identify and track pests.
- **Assess Thresholds:** Compare pest numbers to economic thresholds identified in this guide before deciding on control measures.
- **Beneficial Insects:** Assess the presence and density of natural enemies that may help keep pest populations in check.

Early detection is critical to manage damaging insect pests. Use this guide to help identify the key culprits and know when to intervene with solutions that will help prevent economic losses and protect crop yield.

THE RIGHT INSECT CONTROL, RIGHT WHEN YOU NEED IT

You know insects are coming. You don't always know which type, how bad or exactly when. FMC Canada offers a full portfolio of insecticide solutions to protect your valuable crops against a wide variety of pests.



CARBINE® INSECTICIDE ***Fast acting, selective aphid control plus reduced lygus and tarnished plant bug numbers***	**CORAGEN® MAX INSECTICIDE** (RYNAXYPYR®) ***Fast, selective, extended control[1] of key insect pests in a convenient, concentrated formulation***
CYGON® 400EC INSECTICIDE ***Reliable wheat midge, aphid, lygus bug and spider mite control***	**POUNCE® 384EC INSECTICIDE** ***High performing control of striped and crucifer flea beetles in canola as well as cutworms in a variety of crops***

Armyworm, True

Photo credit: John Gavloski – Manitoba Agriculture

Know Your Pest

Larvae are hairless and about 38-50 mm in length when mature. They can be dark brownish or lighter green with multiple-coloured stripes. The main identifiers are stripes/bands on the prolegs at the backend of the larvae. Their heads are tan in colour and have honeycomb-like markings.

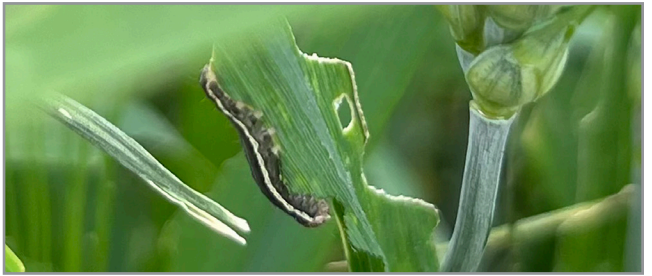
Damage Caused

Larvae feed at night on leaf margins and growing tips. They gradually move up plants, feeding on flowers, panicles and awns, stripping kernels and causing a "frosted" appearance in cereal crops.

Economic Threshold

Cereal crops (before heading): 40 small (<25 mm) larvae/m^2.
Cereal crops (after heading): 20 larvae/m^2 if heads are clipped.

Scouting: Count the number of larvae in at least 5 locations in the field. Larvae are nocturnal, so if scouting during the day, soil surface debris should be examined.



Armyworm, True

Crops: Cereals

Product	Rates & Application Tips	How it Works
CORAGEN® MAX INSECTICIDE	**33.5 mL/ac (60 ac/2 L jug):** When worms are larger (~ 25 mm) and/or populations are high. Residual length is approximately 14 days, depending on crop stage and environmental conditions.	Once treated plant material is ingested, muscle paralysis occurs, stopping feeding quickly. While live insects may be seen shortly after product application, feeding activity will cease, and death will follow within a few days, depending on the insect stage and the environment.
	50.5 mL/ac (40 ac/2 L jug): When worms are larger than 38 mm or populations are high. Residual length is approximately 21 days, depending on crop stage and environmental conditions.	

Begin applications when economic thresholds have been reached. Thorough coverage is important to obtain optimum control. Coragen® MaX insecticide provides extended control via ingestion of treated plant material which means applications can be made when application conditions are best, as direct contact with the pest is not a requirement of control. Ground (minimum of 10 gal/ac) or aerial (5 gal/ac).
Do not make more than 3 applications per year.
Do not apply more than once every 7 days.
Do not apply less than 1 day before harvest.

Aphid, English Grain

Know Your Pest

- **Adults** are 1.5-2 mm in size and yellow-green to reddish-brown with black antennae, leg joints and cornicles.
- **Nymphs** are similar in appearance, but smaller in size.

Damage Caused

Feeding damage typically manifests as yellowing, stunted growth and distorted leaves, sometimes resulting in brown patches in the field. Feeding on developing kernels causes them to shrivel. Aphids extract sap, weakening plant tissue and reducing photosynthesis. Infested plants may exhibit curled or twisted leaves, especially in early growth. The presence of honeydew, a sticky substance excreted by aphids promotes sooty mold growth.

Economic Threshold

Small grains: 12-15 aphids/stem prior to soft dough. Treatment after early dough is not cost-effective.
Canaryseed: 10-20 aphids on 50% of the stems prior to the soft dough stage.
Scouting: Record the number of aphids per head on 20 tillers at five different locations throughout the field. A*phids are susceptible to predation. Natural enemies should be monitored also while scouting.*

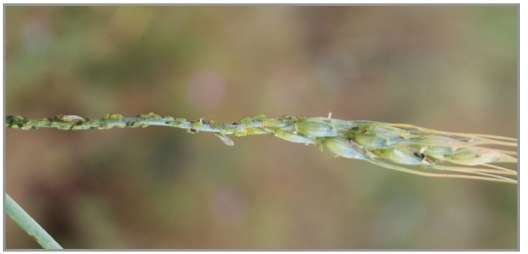


Photo credit: Saskatchewan Ministry of Agriculture

Aphid, English Grain

Crops: Wheat, barley, oats, canaryseed

Product	Rates & Application Tips	How it Works
CYGON® 400EC INSECTICIDE	**Wheat, barley, oats:** Rate: 206 mL/ac (47 ac/jug) Ground (minimum 10 gal/ac) or aerial application (5 gal/ac) Maximum Number of Applications per Year: 2 Minimum Application Interval (Days): 7 Minimum 35-day PHI (Pre-Harvest Interval) and 14-day PGI (Pre-Grazing Interval) **Canaryseed:** Rate: 243 mL/ac (40 ac/jug) Ground (minimum 10 gal/ac) or aerial application (5 gal/ac) Minimum 21-day PHI (Pre-Harvest Interval) Do not apply when bees are foraging.	Acts both by contact and through ingestion to disable cholinesterase, an enzyme essential for central nervous system function. It is readily absorbed and distributed throughout plant tissues.

Aphid, Pea

Know Your Pest

- **Adults** are 3-4 mm in size and are light to dark green. They are pear shaped with long legs. Their eyes are red and prominent.
- **Nymphs** are similar in appearance, but smaller in size.

Damage Caused

Aphids extract sap, weakening plant tissue and reducing photosynthesis. Feeding on peas during flowering and pod stages leads to fewer seeds and smaller seed size. They can transmit Pea Seed-borne Mosaic Virus, compounding crop damage. On alfalfa, they feed on stems and newly expanding leaves, causing yellowing and stunting in high numbers.

Economic Threshold

Field peas: 2-3 aphids per plant in the top 200 mm or 9-12 aphids per 180° sweep.

Faba beans: 34-50 aphids per main branch. This provides a 7-day lead time before economic injury level (96-142 aphids per main faba bean branch).[2]

Lentils: Economic threshold ranges from 20-66 aphids per sweep. This provides a 7-day lead time before aphid populations reach the economic injury level of 78 aphids per sweep.[3]

Seed alfalfa: In Alberta, 150-200 per 90° sweep. In Saskatchewan and Manitoba, 100-200 per 180° sweep when dryland crop is moisture-stressed, or until mid-August.

Aphids are susceptible to predation. Natural enemies should be monitored also while scouting.

Aphid, Pea

Crops: Field peas, faba beans, lentils, alfalfa

Product	Rates & Application Tips	How it Works
CARBINE® INSECTICIDE	**Field peas, faba beans, lentils, alfalfa:** Rate: 49-65 g/ac (25-32 ac/jug; 25 ac/jug recommended) Apply before aphid populations reach economic thresholds or as populations begin to increase but before damaging populations become established. Scout fields and reapply if necessary. Use higher rates for greater pest populations and/or dense foliage. Do not apply more than 65 g/ac per application (up to 3 applications per season). Apply in a minimum of 10 gal/ac water volume.	Feeding stops irreversibly within 30 minutes[4] of contact or ingestion, as pests can't penetrate tissue. Early scouting may reveal live insects, but with little or no feeding. Death occurs within days, depending on conditions and insect stage.
CYGON® 400EC INSECTICIDE	**Field peas:** Rate: 134-185 mL/ac (52-72 ac/jug) May be applied by air or ground equipment. Do not feed or allow livestock to graze treated vines within 21 days after application. Do not apply when bees are foraging. **Alfalfa:** Rate: 206 mL/ac (47 ac/jug) Ground application only (minimum 20 gal/ac). Toxic to bees. Avoid application during the crop blooming period. If applications must be made during the crop blooming period, restrict applications to evening when most bees are not foraging. Do not graze or harvest for forage within 10 days after treatment.	Acts both by contact and through ingestion to disable cholinesterase, an enzyme essential for central nervous system function. It is readily absorbed and distributed throughout plant tissues.

Aphid, Russian Wheat

Photo credit: Frank Peairs - Colorado State University - Bugwood.org

Know Your Pest

- **Adults** are 1.6-2.1 mm long, spindle-shaped and lime green in colour. Shortened antennae and reduced cornicles at the end of the abdomen are distinguishing characteristics.
- **Nymphs** are similar in appearance, but smaller in size.

Damage Caused

Adults and nymphs suck sap from leaves causing streaks between veins. Feeding can cause discolouration, prevent normal unrolling at heading, bleached heads and poorly formed grain.

Economic Threshold

Winter cereals: 15-20% of seedlings infested after Oct. 1.
Spring cereals: 10-15% of seedlings, or 15-20% of plants at boot stage.

Scouting:
Record the number of infested plants per 20 plants at five different locations throughout the field.

Aphids are susceptible to predation. Natural enemies should be monitored also while scouting.

Photo credit: Saskatchewan Ministry of Agriculture

Aphid, Russian Wheat

Crops: Wheat, barley

Product	Rates & Application Tips	How it Works
CYGON 400EC INSECTICIDE	**Wheat, barley (suppression only):** Rate: 206 mL/ac (47 ac/jug) Ground or aerial application. Use sufficient water to obtain good coverage. Maximum Number of Applications per Year: 2 Minimum Application Interval (Days): 7 Minimum 35-day PHI (Pre-Harvest Interval) and 14-day PGI (Pre-Grazing Interval)	Acts both by contact and through ingestion to disable cholinesterase, an enzyme essential for central nervous system function. It is readily absorbed and distributed throughout plant tissues.

Bertha Armyworm

Know Your Pest

- Newly hatched larvae are about 3 mm long and are pale green, with a pale yellowish stripe along each side.
- When disturbed, small larvae may drop off the plant by a fine silken thread.
- As they mature, their colour becomes variable. Some remain green, but many become brown or velvety black.
- At maturity, the larvae are about 40 mm long, with a light brown head and a broad, yellowish-orange stripe along each side.

Damage Caused

In canola, larvae debark pods and chew through to eat the seeds or can entirely consume pods when populations are high. Stripped pods may shatter prematurely and crops can look white in colour. In flax, larvae chew through the stems below the bolls causing them to drop. Larvae feed in morning and evenings.

Economic Threshold

6-34 larvae per m^2 depending on expected seed value and spray costs (control is typically required around 20 larvae per m^2).

Scouting: Monitor Provincial trap counts, and early leaf feeding. At early pod, count the number of larvae in 0.25m^2 (plants and soil surface), at 10-15 locations across the field but away from headlands.

Photo credit: Mike Dolinski

Bertha Armyworm

Crops: Canola, mustard, flax

Product	Rates & Application Tips	How it Works
CORAGEN® MAX INSECTICIDE	**17 mL/ac (120 ac/2 L jug):** When larvae are small (< 25 mm). Larvae should be a minimum of 13 mm long. Residual length is approximately 7 days, depending on crop stage and environmental conditions.	Once treated plant material is ingested, muscle paralysis occurs, stopping feeding quickly. While live insects may be seen shortly after product application, feeding activity will cease, and death will follow within a few days, depending on the insect stage and the environment.
	33.5 mL/ac (60 ac/2 L jug): When larvae are larger (~ 25 mm) and/or populations are high. Residual length is approximately 14 days, depending on crop stage and environmental conditions.	
	50.5 mL/ac (40 ac/2 L jug): When larvae are larger than 38 mm or populations are high. Residual length is approximately 21 days, depending on crop stage and environmental conditions.	

Target fields when economic threshold is reached. Coragen® MaX insecticide provides extended control via ingestion of treated plant material which means applications can be made when application conditions are best, as direct contact with the pest is not a requirement of control. Thorough coverage is important to obtain optimum control. Ground (minimum of 10 gal/ac) or aerial (5 gal/ac).
Do not make more than 3 applications per year.
Do not apply more than once every 5 days.
Do not apply less than 1 day before harvest.

Cutworm, Darksided

Photo credit: John Gavloski – Manitoba Agriculture

Know Your Pest

Larvae are hairless and up to 37 mm long. They are grayish with a reddish background and a prominent white stripe along each side just above the legs. Their heads are orange-brown with darker spots. Overwinters as eggs.

Damage Caused

Larvae feed above-ground on leaves and stems of young plants, causing defoliation and plant death. Increased bare soil patches shortly after crop emergence indicate possible infestation. Generalist species that has a broad host range.

Economic Threshold

Cereals and oilseeds: 5-6 larvae/m^2 (nominal threshold).
Peas: 2-3 larvae/m^2.
Dry beans and soybeans: 1 small larva (<25 mm) per meter of row or 20% of plants cut (nominal threshold).

Photo credit: Saskatchewan Ministry of Agriculture

Cutworm, Darksided

Crops: Cereals, corn (excluding sweet corn), dry beans, oilseeds, lentils, peas, potatoes, soybeans

Product	Rates & Application Tips	How it Works
CORAGEN MAX INSECTICIDE	**Cereals, oilseeds, pulses:** Rate: 33.5 mL/ac (60 ac/jug) Begin applications when economic thresholds have been reached. Thorough coverage is important to obtain optimum control. Ground (minimum of 10 gal/ac) or aerial (5 gal/ac). Do not make more than 3 applications per year. Do not apply less than 1 day before harvest.	Once treated plant material is ingested, muscle paralysis occurs, stopping feeding quickly. While live insects may be seen shortly after product application, feeding activity will cease, and death will follow within a few days, depending on the insect stage and the environment.
POUNCE 384EC INSECTICIDE	**Cereals, corn (excluding sweet corn), canola, flax, sunflowers, peas, lentils, potatoes:** Rate: 125 mL/ac (80 ac/jug) Apply only up to 5-leaf stage. Ground application should be made under warm, moist conditions in the evening or at night when cutworm activity is highest. Do not disturb soil surface for 5 days after treatment. Ground (minimum of 10 gal/ac) or aerial (5 gal/ac). Do not make more than 2 applications per year. Only one of these applications can be made by air per year.	Permethrin (active ingredient) affects insects on contact. Permethrin affects the nervous system in insects, causing muscle spasms, paralysis and death.

Cutworm, Dingy

Photo credit: John Gavloski – Manitoba Agriculture

Know Your Pest

Larvae are hairless and about 25-32 mm long. They are pale grayish-brown with a broad gray stripe down the back with light gray V-shaped patterns and four black spots on each segment. Overwinters as larvae.

Damage Caused

Larvae feed primarily above ground on leaves, rarely on stems. Increased bare soil patches shortly after crop emergence indicate possible infestation. Generalist species that has a broad host range.

Economic Threshold

Cereals: 3-4 larvae/m^2.
Oilseeds: 25-30% stand reductions.
Peas and lentils: 2-3 larvae/m^2 in top 70 mm of soil.

Photo credit: Saskatchewan Ministry of Agriculture

Cutworm, Dingy

Crops: Cereals, corn (excluding sweet corn), dry beans, oilseeds, lentils, peas, potatoes, soybeans

Product	Rates & Application Tips	How it Works
CORAGEN MAX INSECTICIDE	**Cereals, oilseeds, pulses:** Rate: 33.5 mL/ac (60 ac/jug) Begin applications when economic thresholds have been reached. Thorough coverage is important to obtain optimum control. Ground (minimum of 10 gal/ac) or aerial (5 gal/ac). Do not make more than 3 applications per season. Do not apply less than 1 day before harvest.	Once treated plant material is ingested, muscle paralysis occurs, stopping feeding quickly. While live insects may be seen shortly after product application, feeding activity will cease, and death will follow within a few days, depending on the insect stage and the environment.
POUNCE 384EC INSECTICIDE	**Cereals, corn (excluding sweet corn), canola, flax, sunflowers, peas, lentils, potatoes:** Rate: 125 mL/ac (80 ac/jug) Apply only up to 5-leaf stage. Ground application should be made under warm, moist conditions in the evening or at night when cutworm activity is highest. Do not disturb soil surface for 5 days after treatment. Ground (minimum of 10 gal/ac) or aerial (5 gal/ac). Do not make more than 2 applications per year. Only one of these applications can be made by air per year.	Permethrin (active ingredient) affects insects on contact. Permethrin affects the nervous system in insects, causing muscle spasms, paralysis and death.

Cutworm, Pale Western

Know Your Pest

Larvae are hairless and about 40 mm long when mature.
They have a pale gray to greenish gray body with a yellow-brown head, featuring two distinct vertical black dashes.

Damage Caused

- Newly hatched larvae feed on emerging shoots and leaves, creating small holes.
- As they mature, larvae feed primarily below-ground, severing plants just below the soil surface, occasionally pulling the plants underground for consumption.
- Damage results in thinning or bare patches in the field, especially on sandy hilltops and south-facing slopes.
- Cereal crops are preferred.

Economic Threshold

Cereals: 3-4 larvae/m^2.
Flax and canola: 4-5 larvae/m^2.
Peas and lentils: 2-3 larvae/m^2.
Chickpeas: 1 or more larvae per meter of row, when larvae are small (less than 20 mm), or 20% of plants cut.

Photo credit: Saskatchewan Ministry of Agriculture

Cutworm, Pale Western

Crops: Cereals, corn (excluding sweet corn), dry beans, oilseeds, lentils, peas, potatoes, soybeans

Product	Rates & Application Tips	How it Works
CORAGEN MAX INSECTICIDE	**Cereals, oilseeds, pulses:** Rate: 33.5 mL/ac (60 ac/jug) Begin applications when economic thresholds have been reached. Thorough coverage is important to obtain optimum control. Ground (minimum of 10 gal/ac) or aerial (5 gal/ac). Do not make more than 3 applications per season. Do not apply less than 1 day before harvest.	Once treated plant material is ingested, muscle paralysis occurs, stopping feeding quickly. While live insects may be seen shortly after product application, feeding activity will cease, and death will follow within a few days, depending on the insect stage and the environment.
POUNCE 384EC INSECTICIDE	**Cereals, corn (excluding sweet corn), canola, flax, sunflowers, peas, lentils, potatoes:** Rate: 125 mL/ac (80 ac/jug) Apply only up to 5-leaf stage. Ground application should be made under warm, moist conditions in the evening or at night when cutworm activity is highest. Do not disturb soil surface for 5 days after treatment. Ground (minimum of 10 gal/ac) or aerial (5 gal/ac). Do not make more than 2 applications per year. Only one of these applications can be made by air per year.	Permethrin (active ingredient) affects insects on contact. Permethrin affects the nervous system in insects, causing muscle spasms, paralysis and death.

Cutworm, Redbacked

Know Your Pest

Larvae are hairless and about 38 mm long. They have a broad reddish-brown stripe along their back with a central dark line bordered by a dark band on either side. Overwinter as eggs.

Damage Caused

- Young larvae feed on newly emerging shoots and leaves, creating small holes.
- Mature larvae sever plants at or just below the soil surface and occasionally pull severed plants underground to feed.
- Damage often results in thinning rows or bare patches in fields, particularly on sandy hilltops and slopes.
- Generalist host range.

Economic Threshold

Cereals: 5-6 larvae/m^2.
Peas and lentils: 2-3 larvae/m^2.
Dry beans and soybeans: 1 small larva
Chickpeas, dry beans and soybeans: 1 small larva (<25 mm) per meter of row or 20% of plants cut (nominal threshold).
Flax and canola: 4-5 larvae/m^2.
Sunflowers: 1 cutworm or more per square foot or if there is a 25-30% stand reduction.

Photo credit: Saskatchewan Ministry of Agriculture

Cutworm, Redbacked

Crops: Cereals, corn (excluding sweet corn), dry beans, oilseeds, lentils, peas, potatoes, soybeans

Product	Rates & Application Tips	How it Works
CORAGEN MAX INSECTICIDE	**Cereals, oilseeds, pulses:** Rate: 33.5 mL/ac (60 ac/jug) Begin applications when economic thresholds have been reached. Thorough coverage is important to obtain optimum control. Ground (minimum of 10 gal/ac) or aerial (5 gal/ac). Do not make more than 3 applications per season. Do not apply less than 1 day before harvest.	Once treated plant material is ingested, muscle paralysis occurs, stopping feeding quickly. While live insects may be seen shortly after product application, feeding activity will cease, and death will follow within a few days, depending on the insect stage and the environment.
POUNCE 384EC INSECTICIDE	**Cereals, corn (excluding sweet corn), canola, flax, sunflowers, peas, lentils, potatoes:** Rate: 125 mL/ac (80 ac/jug) Apply only up to 5-leaf stage. Ground application should be made under warm, moist conditions in the evening or at night when cutworm activity is highest. Do not disturb soil surface for 5 days after treatment.	Permethrin (active ingredient) affects insects on contact. Permethrin affects the nervous system in insects, causing muscle spasms, paralysis and death.

Diamondback Moth

Know Your Pest

Larvae are up to 8 mm long. They are narrow and green in colour. They wriggle backward when disturbed and often drop on a silken thread.

Damage Caused

- Newly hatched larvae tunnel in the leaves before exiting to feed on leaf surfaces, creating shot holes and completely consuming leaves except the veins.
- As the crop matures, larvae move upwards in the canopy to feed on the pods where the majority of economic damage occurs. Pods that have been fed on will desiccate more quickly, resulting in yield loss.

Economic Threshold

Vegetative to flowering stage:
100-150 larvae/m^2.
Late flowering to pod stage:
200-300 larvae/m^2.

Photo credit: Mike Dolinski

Diamondback Moth

Crops: Canola, mustard

Product	Rates & Application Tips	How it Works
CORAGEN MAX INSECTICIDE	**Canola, mustard:** Rate: 17 mL/ac (120 ac/jug) Begin applications when economic thresholds have been reached. Thorough coverage is important to obtain optimum control. Ground (minimum of 10 gal/ac) or aerial (5 gal/ac). Do not make more than 3 applications per season. Do not apply more than once every 5 days. Do not exceed a total of 151 mL of Coragen® MaX insecticide per acre per year.	Once treated plant material is ingested, muscle paralysis occurs, stopping feeding quickly. While live insects may be seen shortly after product application, feeding activity will cease, and death will follow within a few days, depending on the insect stage and the environment.

Flea Beetle

Know Your Pest

Crucifer flea beetle:

- Uniformly blue-black and shiny.
- They are small, only 2.5 mm long, and hop away when disturbed.

Striped flea beetle:

- Has two horizontal yellow stripes running the length of its black body.
- They are small, only 2.5 mm long, and hop away when disturbed.

Economic Threshold

25% leaf damage on cotyledons and adults are continuing to feed. Poor growing conditions may require a lower threshold due to plants being under more stress and because flea beetles feed more actively under these conditions. Feeding damage can rapidly increase so frequent scouting is required.

Damage Caused

- Adults feed on cotyledons and first and second true leaves of canola, creating “shot-holes” in the leaves.
- Stem-feeding on canola seedlings can occur under rainy, and/or cool conditions, which can lead to the stem breaking or plant wilting.
- Second generation adults that appear in late summer can feed on canola pods and cause premature ripening under very high populations.

Flea Beetle

Crops: Canola

Product	Rates & Application Tips	How it Works
POUNCE® 384EC INSECTICIDE	**Striped and crucifer flea beetles:** Rate: 62 mL/ac (160 ac/10 L jug) Apply only up to 5 leaf stage. **Ground application:** Apply in sufficient water for good coverage when insects are present. Application should be made when the beetles are actively feeding. For severe infestations, use 73 mL/ac. **Aerial application:** Apply in 1-4 gal/ac (11-35 L/Ha) spray water. Can only be applied by air once per season.	Permethrin (active ingredient) affects insects on contact. Permethrin affects the nervous system in insects, causing muscle spasms, paralysis and death.

Grasshopper, Packard

Know Your Pest

- First instar nymphs are pale green to yellow-brown, speckled with small dark spots.
- Adults are 27-32 mm long. Gray to dark yellow body with two light-colored stripes extending from behind the eyes to the end of the thorax. Forewings are uniformly gray without distinctive stripes. Last two segments of hind legs are blue-green.

Damage Caused

- Nymphs and adults feed on host plants, clipping leaves and stems.
- Damage intensifies in dry conditions, leading to defoliation and reduced crop yield.
- Preference for light-textured soils with sparse grass cover. More common in the Western prairies.

Economic Threshold

Alfalfa: 12/m^2.
Cereals:
Nymphs: 30-40/m^2.
Fifth instar and adults: 10-12/m^2.
Canola: 7-12/m^2.
Flax: 2/m^2 at green boll stage.
Lentils: 2/m^2 during flowering and podding.
Pasture & rangeland: >12/m^2.

Photo credit: Howard F. Schwartz - Colorado State University - Bugwood.org

Grasshopper, Packard

Crops: Alfalfa, pasture & rangeland, cereals, pulses, oilseeds

Product	Rates & Application Tips	How it Works
CORAGEN® MAX INSECTICIDE	**17 mL/ac (120 ac/2 L jug):** Nymphs to 2nd instar stage. Apply when nymphs are at threshold and causing early season damage but egg hatch is not complete. Move to higher rate range, even in early crop stage, if pest pressure is high. **25 mL/ac (80 ac/2 L jug):** 3rd to 4th instar stage and continued pressure is entering the field. Plant is close to final size (ie. start of flowering/ heading). Move to higher rate range, even in early crop stage, if pest pressure is high. **33.5 mL/ac (60 ac/2 L jug):** 4th instar to adult stage. High insect populations during flowering/grain formation stage (feeding is occurring at a sensitive crop stage).	Once treated plant material is ingested, muscle paralysis occurs, stopping feeding quickly. While live insects may be seen shortly after product application, feeding activity will cease, and death will follow within a few days, depending on the insect stage and the environment.
CYGON® 400EC INSECTICIDE	**Alfalfa:** Rates: **Nymphs:** 267 mL/ac (36 ac/jug) **Adults**: 413-437 mL/ac (22 ac/jug) **Canola:** Rate: 413-437 mL/ac (22 ac/jug) **Pasture:** Rates: **Nymphs:** 267 mL/ac (36 ac/jug) **Adults:** 413-486 mL/ac (20 ac/jug)	Acts both by contact and through ingestion to disable cholinesterase, an enzyme essential for central nervous system function. It is readily absorbed and distributed throughout plant tissues.

Grasshopper, Clearwinged

Know Your Pest

- Newly hatched nymphs are black with a distinctive white band encircling the thorax.
- Adults are 21-32 mm long. Body is yellowish to brownish and the wings are clear with dark mottled patches. Two stripes beginning at the thorax converge at the tip of the forewings.

Damage Caused

- Nymphs and adults feed on host plants, clipping leaves and stems.
- Damage intensifies in dry conditions, leading to defoliation and reduced crop yield.
- Prefers cereal grains and rarely feeds on broadleaf plants.

Economic Threshold

Cereals:

Nymphs: 30-40/m^2.

Fifth instar and adults: 10-12/m^2.

Grasshopper, Clearwinged

Crops: Cereals

Product	Rates & Application Tips	How it Works
CORAGEN® MAX INSECTICIDE	**17 mL/ac (120 ac/2 L jug):** Nymphs to 2nd instar stage. Apply when nymphs are at threshold and causing early season damage but egg hatch is not complete. Move to higher rate range, even in early crop stage, if pest pressure is high.	Once treated plant material is ingested, muscle paralysis occurs, stopping feeding quickly. While live insects may be seen shortly after product application, feeding activity will cease, and death will follow within a few days, depending on the insect stage and the environment.
	25 mL/ac (80 ac/2 L jug): 3rd to 4th instar stage and continued pressure is entering the field. Plant is close to final size (ie. start of flowering/heading). Move to higher rate range, even in early crop stage, if pest pressure is high.	
	33.5 mL/ac (60 ac/2 L jug): 4th instar to adult stage. High insect populations during flowering/grain formation stage (feeding is occurring at a sensitive crop stage).	

Grasshopper, Migratory

Know Your Pest

- Nymphs have a mottled grayish body with a stripe across the head. Resemble adults but are smaller and wingless.
- Adults are 23-28 mm long. Brownish to grayish body with a small black stripe across the head. Hind legs are marked with a series of black bands.

Damage Caused

- Nymphs and adults feed on a wide variety of plants, clipping leaves, stems, pods and heads.
- Damage intensifies in dry conditions, leading to defoliation and reduced crop yield.
- Prefers broadleaf plants but will feed on cereal grains, alfalfa and other plants.

Economic Threshold

Cereals:
Nymphs: 30-40/m^2.
Fifth instar and adults: 10-12/m^2.
Canola: 7-12/m^2.
Lentils: 2/m^2 during flowering and podding.
Pasture & rangeland: >12/m^2.

Grasshopper, Migratory

Crops: Cereals, canola, lentils, pasture & rangeland

Product	Rates & Application Tips	How it Works
CORAGEN MAX INSECTICIDE	**17 mL/ac (120 ac/2 L jug):** Nymphs to 2nd instar stage. Apply when nymphs are at threshold and causing early season damage but egg hatch is not complete. Move to higher rate range, even in early crop stage, if pest pressure is high. **25 mL/ac (80 ac/2 L jug):** 3rd to 4th instar stage and continued pressure is entering the field. Plant is close to final size (ie. start of flowering/ heading). Move to higher rate range, even in early crop stage, if pest pressure is high. **33.5 mL/ac (60 ac/2 L jug):** 4th instar to adult stage. High insect populations during flowering/grain formation stage or feeding is occurring at a sensitive crop stage.	Once treated plant material is ingested, muscle paralysis occurs, stopping feeding quickly. While live insects may be seen shortly after product application, feeding activity will cease, and death will follow within a few days, depending on the insect stage and the environment.
CYGON 400EC INSECTICIDE	**Canola:** Rate: 413-437 mL/ac (22 ac/jug) **Pasture:** Rates: **Nymphs:** 267 mL/ac (36 ac/jug) **Adults:** 413-486 mL/ac (20 ac/jug) Apply in a minimum of 10 gal/ac water volume. Toxic to bees. Avoid application during the crop blooming period. If applications must be made during the crop blooming period, restrict applications to evening when most bees are not foraging.	Acts both by contact and through ingestion to disable cholinesterase, an enzyme essential for central nervous system function. It is readily absorbed and distributed throughout plant tissues.

Grasshopper, Two-striped

Know Your Pest

- Newly hatched nymphs are tan and change to brown or light green as they mature. They feature two faint stripes down the thorax.
- Adults are 26-40 mm long. Brownish or greenish body with black or brown markings. Two pale stripes extend from behind the eyes to the tip of the forewings. Hind legs have a distinct longitudinal black stripe.
- Hatch 8-10 days earlier than migratory grasshoppers.

Damage Caused

- Nymphs and adults feed on a wide variety of plants, clipping leaves, stems, pods and heads.
- Damage intensifies in dry conditions, leading to defoliation and reduced crop yield.
- Prefers broadleaf plants but is a generalist. More common in black and dark brown soil zones.

Economic Threshold

Alfalfa: 12/m^2.
Cereals:
Nymphs: 30-40/m^2.
Fifth instar and adults: 10-12/m^2.
Canola: 7-12/m^2.
Flax: 2/m^2 at green boll stage.
Lentils: 2/m^2 during flowering and podding.
Soybeans and dry beans:
Pre-bloom: 30% defoliation
Bloom to pod-fill: 15% defoliation
Pod fill to maturity: 25% defoliation unless pod feeding is observed.

Photo credit: Howard F. Schwartz - Colorado State University - Bugwood.org

Grasshopper, Two-striped

Crops: Alfalfa, cereals, canola, flax, lentils, soybeans, dry beans

Product	Rates & Application Tips	How it Works
CORAGEN® MAX INSECTICIDE	**17 mL/ac (120 ac/2 L jug):** Nymphs to 2nd instar stage. Apply when nymphs are at threshold and causing early season damage but egg hatch is not complete. Move to higher rate range, even in early crop stage, if pest pressure is high. **25 mL/ac (80 ac/2 L jug):** 3rd to 4th instar stage and continued pressure is entering the field. Plant is close to final size (ie. start of flowering/heading). Move to higher rate range, even in early crop stage, if pest pressure is high. **33.5 mL/ac (60 ac/2 L jug):** 4th instar to adult stage. High insect populations during flowering/grain formation stage or feeding is occurring at a sensitive crop stage.	Once treated plant material is ingested, muscle paralysis occurs, stopping feeding quickly. While live insects may be seen shortly after product application, feeding activity will cease, and death will follow within a few days, depending on the insect stage and the environment.
CYGON® 400EC INSECTICIDE	**Alfalfa:** Rates: **Nymphs:** 267 mL/ac (36 ac/jug) **Adults:** 413-437 mL/ac (22 ac/jug) **Canola:** Rate: 413-437 mL/ac (22 ac/jug) Apply in a minimum of 10 gal/ac water volume. Ground application only. Toxic to bees. Avoid application during the crop blooming period. If applications must be made during the crop blooming period, restrict applications to evening when most bees are not foraging.	Acts both by contact and through ingestion to disable cholinesterase, an enzyme essential for central nervous system function. It is readily absorbed and distributed throughout plant tissues.

Lygus Bug

Know Your Pest

- Nymphs are pale green with five black dots on the thorax and abdomen. Wing buds are noticeable on older nymphs.
- Adults are about 6 mm long. Pale green to reddish-brown or black with a mottled appearance. They have a distinctive triangular or V-shaped marking on the upper center of the back with membranous wingtips.

Damage Caused

Adults and nymphs feed on nutrient-rich buds and flowers by piercing the plant tissue and sucking the plant sap, causing flower abortion. Large lygus nymphs can also pierce through the pod and feed on the developing seed, resulting in shriveled seeds and reduced yield in canola and brown spots and downgraded quality in faba bean.

Economic Threshold

Alfalfa: 8 lygus per sweep.
Canola: Greater than 30 lygus per 10 sweeps at the early pod stage.
Faba beans: Thresholds have not been determined in all provinces but preliminary research suggests a nominal threshold to prevent downgrading is as few as 5-10 lygus per 10 sweeps at early pod stage.
Lentils: 10 lygus per 25 sweeps.
Peas: 10 lygus per 25 sweeps.
Dry beans: A suggested nominal threshold was proposed of 10 lygus adults/m^2 at the beginning pod (R2) to mid-bloom (R3) when conditions are not favourable for the plants but are favourable for lygus bugs (e.g., hot and dry).

Lygus Bug

Crops: Alfalfa, canola, dry beans, faba beans, field peas, lentils

Product	Rates & Application Tips	How it Works
CARBINE® INSECTICIDE	**Field peas, dry beans, faba beans, alfalfa, lentils:** Rate: 81 g/ac (20 ac/jug) Coverage is essential for control. Apply in a minimum of 10 gal/ac water volume. Ground application only.	Feeding stops irreversibly within 30 minutes[4] of contact or ingestion, as pests can't penetrate tissue. Early scouting may reveal live insects, but with little or no feeding. Death occurs within days, depending on conditions and insect stage.
CYGON® 400EC INSECTICIDE	**Canola:** Rate: 219-437 mL/ac (22-44 ac/jug) Apply in a minimum of 10 gal/ac water volume. Ground or aerial application. Repeat application only when necessary. Toxic to bees. Do not apply during the crop blooming period or during the 5-day period before the crop blooms. **Alfalfa:** Rate: 206 mL/ac (47 ac/jug) Apply in a minimum of 10 gal/ac water volume. Ground application only. Toxic to bees. Avoid application during the crop blooming period. If applications must be made during the crop blooming period, restrict applications to evening when most bees are not foraging.	Acts both by contact and through ingestion to disable cholinesterase, an enzyme essential for central nervous system function. It is readily absorbed and distributed throughout plant tissues.

Spider Mite, Twospotted

Adult featured in photo

Know Your Pest

- **Larvae** have 3 pairs of legs. Nymphs have 4 pairs of legs and resemble adults but are smaller and less distinctly marked.
- **Adults** are 0.5 mm in size and visible as only small specs to the unaided eye. They have eight legs and oval-shaped bodies ranging in color from greenish-yellow to orange, with two dark spots on their abdomen.

Damage Caused

Adults and nymphs puncture cells on leaf undersides to feed, creating characteristic stippling, yellowing or browning of leaves. Severe infestations can cause leaves to dry and drop, reducing crop yields. Webbing is often visible on infested leaves, which helps protect mites from predators and environmental conditions. Populations will increase rapidly during prolonged hot, dry weather causing some to mistake mite symptoms for drought.

Economic Threshold

There are no established thresholds, but action should be considered if damage is visible, populations are increasing and plants appear stressed.

Photo credit: Eric R. Day - Virginia Polytechnic Institute and State University - Bugwood.org

Spider Mite, Twospotted

Crops: Soybeans

Product	Rates & Application Tips	How it Works
CYGON 400EC INSECTICIDE	**Soybeans:** Rate: 486 mL/ac (20 ac/jug) Apply in a minimum of 10 gal/ac water volume. Ground application only. Toxic to bees. Avoid application during the crop blooming period. If applications must be made during the crop blooming period, restrict applications to evening when most bees are not foraging. Maximum Number of Applications per Year: 2 Minimum 30-day PHI (Pre-Harvest Interval) Target susceptible R4 to R5 stage and consider presence of natural predators prior to application.	Acts both by contact and through ingestion to disable cholinesterase, an enzyme essential for central nervous system function. It is readily absorbed and distributed throughout plant tissues.

Thrips

Female featured in photo

Know Your Pest

- Adults are 1.1-1.8 mm long, with a dark brown/black body. Females have narrow, fringed forewings. Males are wingless.
- Larvae are white/pale yellow-green with red eyes, and 0.25-1.8 mm in length.

Damage Caused

Piercing and sucking insect. Feeding at head formation causes shriveled kernels, head deformation and reduced overall grain fill. Feeding on the flag leaf can also decrease kernel weight.

Economic Threshold

Barley: 7- 8 thrips/stem prior to head emergence.

Scouting: Begin monitoring when the flag leaf is visible and continue until full head emergence. Count adults on the top 2 leaf sheaths on a minimum of 9 plants. To find barley thrips, unroll the leaf sheath close to the stem.

Thrips

Crops: Barley

Product	Rates & Application Tips	How it Works
CYGON 400EC INSECTICIDE	**Barley:** Rate: 206 mL/ac (47 ac/jug) Ground or aerial application. Use sufficient water to obtain good coverage. Maximum Number of Applications per Year: 2 Minimum Application Interval (Days): 7 Minimum 35-day PHI (Pre-Harvest Interval) and 14-day PGI (Pre-Grazing Interval)	Acts both by contact and through ingestion to disable cholinesterase, an enzyme essential for central nervous system function. It is readily absorbed and distributed throughout plant tissues.

Wheat Midge

Know Your Pest

- Adults are 2-3 mm long with an orange body, large black eyes and relatively long legs and antennae.
- Young larvae are translucent white and gradually turn orange as they mature. They are 2-3 mm long when mature.

Damage Caused

Larvae feed on the developing wheat kernels, resulting in aborted, shriveled, misshapen, cracked or scarred kernels. Adults do not cause damage.

Economic Threshold

To prevent yield loss:
One adult midge per 4-5 heads.
To prevent grade loss:
One adult midge per 8-10 wheat heads.

Photo credit: Mike Dolinski

Wheat Midge

Crops: Wheat

Product	Rates & Application Tips	How it Works
CYGON 400EC INSECTICIDE	**Wheat:** Rate: 486 mL/ac (20 ac/jug) Ground (10 gal/ac) or aerial application (5 gal/ac). If adult midges are present (1 midge / 4-5 wheat heads), applications should be made when 25% of the wheat head has fully emerged from the boot but before flowering has begun. At this stage, wheat first becomes susceptible to attack by the egg-laying females. Applications should be made in the late afternoon or evening when temperatures exceed 15°C and the wind speed is less than 10 km/h. High volume sprays will improve penetration of the crop. Proper timing of application is essential for control. Cygon® 400EC insecticide will control flying adults but will not control larvae developing in the wheat florets.	Acts both by contact and through ingestion to disable cholinesterase, an enzyme essential for central nervous system function. It is readily absorbed and distributed throughout plant tissues.

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[1] Depending on rate and when weather and temperature are optimal.
[2] Zhou, N., Wist, T. and Prager, S.M., 2024. Economic thresholds and economic injury level for pea aphid in tannin and low tannin faba bean. Crop Protection, 186, p.106919.
[3] Zhou, N., Wist, T., Prager, S.M., 2023. Development of economic thresholds for pea aphid management in lentil based on in-field insecticide efficacy trials. Journal of Economic Entomology, 116 (4) 1233-1242.
[4] Morita, M., Ueda, T., Yoneda, T., Koyanagi, T. and Haga, T., 2007. Flonicamid, a novel insecticide with a rapid inhibitory effect on aphid feeding. Pest Management Science: formerly Pesticide Science, 63 (10), pp.969-973.

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